

## **What Do Farmers Eat Today? The Appalachian Small Farming Diet**

Jordan Miller, Lanae Ball, Ph.D., Angela D. Mead, Ed.D.

### **Acknowledgements**

I want to express my immense gratitude to Dr. Lanae Ball for offering me so much wisdom and guidance throughout this project. You were the one who showed me grace and affirmed me when I was at my most overwhelmed and discouraged point. This along with many other hours spent proofreading and evaluating exemplified what a true mentor is. I wish there were more people like you, people who provide wind that both propels and offers others a breath of fresh air. I would like to thank graduate student Maggie Gartman for all her time spent helping me obtain IRB approval and accompanying me to numerous interviews. The conversations we had on the way back offered me so much wisdom and perspective, I can't imagine this project not having your name stamped on it somewhere. I want to thank Dr. Angela Mead for swooping in to save the day in the final stages of this project and for exemplifying joy even during her own struggles. You truly are a beacon of light for students who have worked and worried themselves into a corner. I also want to thank my boyfriend Ryan for listening to me talk about this project for over eight months and never wavering in support. I couldn't have done it without you all. Thank you from the bottom of my heart.

## **Abstract**

Though the Standard American Diet (SAD), the dietary habits of farmers, and recently the Traditional Southern Appalachian Diet have been described and documented in the literature, the dietary habits of small farmers, and particularly southern Appalachian farmers remain undocumented despite speculations of poor seasonal dietary habits. This qualitative study documented 9 questionnaire-guided interviews with self-identified farmers recruited from local farmer's markets. Topics ranged from seasonal crop rotations to food ethics in order to identify dietary patterns related to seasonal fruit, vegetable, and processed food intake. Interviews were recorded at participants' homes and lasted about 1.5 hours on average. Transcripts were reviewed for consistency in choice of themes. Two primary themes related to the objectives were: 1) Seasonal Food and 2) Ethical Food. Most farmers consumed 4-8 servings of fruit and vegetables in the summer and 3-5 servings in the winter. Processed food intake was limited to cooking ingredients during mealtimes, but was heavily present during snacking. Restaurant dining was more frequent during the summer. Fat, meat, and dessert consumption increased during the winter. Most farmers expressed health, locality, and cost were primary factors affecting their food choices. Participants and other farmers in the region were not found to be at nutritional risk; however, concerns for the economic viability of farming arose as a theme outside the parameters of the objectives of this study.

## **Introduction**

Countless publications describing the Standard American Diet (SAD) have reported that many Americans are consuming large, frequent amounts of processed or convenience foods and less than 1 cup of fruit and 2 cups of vegetables per day (below the guidelines of 2 fruits and 3 vegetables per day). It has been speculated that even American farmers who have access to a variety of fruits and vegetables are falling into SAD habits during busy seasons on the farm. However, there is currently very little data on the dietary habits of farmers, let alone farmers who fall into lower income brackets.

North Carolina (NC) is home to about 50,218 farms and principal farm operators, 87% of which are male and 94% are white. Of the 50,218 farms, 8.3%, are less than 1 to 9 acres in size. The most common farm size in NC is 10 to 49 acres, medium size farming, attributing to 40% of all farms in NC (USDA, 2012). The king crops of the state include livestock, hay, soybeans, wheat, corn, and cotton. Of the 5,328,382 acres of land used for farming in NC, only 2.3% of that is used for vegetables, 0.24% are used for tree fruit, and 0.16% are used for berries.

The Appalachian Mountain region of NC features lower temperatures and steeper terrain than other parts of the state, habituating rural communities and few large-scale farms. The Traditional Southern Appalachian Diet was described in 2014 to include high-fat preparations methods of cultural foods, such as meat, beans, milk, and a variety of fruits and vegetables, both foraged and cultivated, contributing to modern obesity-related disease states with the decline of physical activity and increase of processed food consumption (Visocky, Gutschall, Thompson, & Ball, 2016). It can be hypothesized that Appalachian farmers are currently consuming similar diets; however, there is currently no data on the topic.

This study bridges the current gap in knowledge about the dietary habits of farmers in western North Carolina. The objectives of this study were to: 1) describe the fruit, vegetable, and processed food consumption and 2) observe the differences in diet seasonality of farmers residing in Watauga and surrounding counties.

## **Literature Review**

### *The Standard American Diet*

The infamous standard American diet (SAD), also known as the western pattern diet, is marked by excessive intakes of refined carbohydrates, added sugar, saturated and trans fats that accompany fried foods, convenience or fast foods, processed or prepackaged foods, sugary drinks, and very low intakes of nutrient-dense foods, especially fruits and vegetables. This diet is iconic for being nutrient poor, calorie dense, and promotive of obesity and numerous chronic diseases, such as cardiovascular diseases, type 2 diabetes, and certain cancers (Grotto & Zied, 2010). The SAD has been gradually increasing in popularity since the industrial revolution and has expanded even more rapidly in the past 70 years. According to the Economic Research Service, the average American consumes a mere 0.9 cups of fruit and 1.7 cups of vegetables, a sad diet indeed compared to the Dietary Guidelines for Americans minimum recommendation of 2 cups of fruits and 3 cups of vegetables per day (Grotto & Zied, 2010).

The SAD began as a gradual movement towards more refined, processed foods with longer shelf lives and higher caloric densities. Following the centuries-old practice of agriculture, the Industrial Revolution in 1760 and onwards spawned mass agricultural production and mass processing of refined carbohydrates and fats (Cordain, et al., 2005).

Early to mid-19th century innovations such as the steam engine, mechanical reaper, and railroads allowed for the expansion of grain and consequently greater cattle yields and broader distribution. For the first time in history, dairy, cereals, sugar, vegetable oils, and alcohol became staples of the North American diet, attributing to 72.1% of the average American's daily caloric intake (Cordain, et al., 2005). It is also worth noting that as the United States government began subsidizing agriculture with the 1922 Grain Futures Act followed by decades of agriculture acts and farm bills post-Great Depression, grain and staple crop farmers are far more financially supported by federal and state policies than fruit and vegetables farmers, leading to increased intakes of grains and other carbohydrate-rich staple crops and decreased intakes of fruits and vegetables (Fields, 2004).

The National Health and Nutrition Examination Survey (NHANES) found that in 2012, the average American adult consumed 2191 kcals, 16% of that deriving from protein, 49% from carbohydrate, 33% from fat (11% saturated, 12% monounsaturated, 8% polyunsaturated), and 3% from alcohol. NHANES also reported that for the average adult American, 25% of caloric intake came from restaurants rather than from home cooking. The SAD has contributed to millions of deaths and chronic illnesses for 21st century Americans. In fact, the five leading causes of death in the United States in 2014 in descending order were heart disease, cancer, chronic obstructive pulmonary disorder, unintentional injuries, and stroke (CDC, 2014). Five out of the four listed are heavily contributed to by unhealthy lifestyle habits.

## *The Farming Diet*

Modern Farmer magazine published an article in 2014 highlighting the dietary habits of farmers. The reporter interviewed numerous farmers from varying states, primarily Massachusetts, to uncover that farmers often resort to a SAD during busy seasons. Many farmers mentioned the familial occupation of farming as well as the time limitations of making preparing their own crops for meals. The reported described a convergence of cultures; a once slow-growing, slow-going business has merged with a fast-paced economy and farmers struggle to meet the demands of such.

Though there are many opinions to be stated about the dietary habits of farmers in the United States, there is very little scientific documentation of the past or present dietary habits of American farmers. This is a disconcerting issue considering the rapid augmentation of farming scale and the rapid transition from natural to processed foods the nation has experienced in the past 50 years. Farmers have not always been known to follow a healthful diet. Throughout the 19th century, farmers, particularly southern farmers, had a higher average weight and height than workers in other industries (Scott, 2015). The introduction of McCormack's reaper and John Deere's plow in the mid-1800s reduced the amount of physical activity required by the occupation while the resolution of the civil war post-1865 increased the market price of food. As a result, mechanical agriculture equipment became a necessary component of farming, which further reduced the amount of physical labor required of a farmer. Weight for blacks and whites decreased across the country as the price of nutrition rose, especially for whites (Scott, 2015). However, farmers were still some of the most nourished people in comparison to industrial workers. Black farmers were 0.85% taller

and 1.45% heavier than other black workers and white farmers were 0.92% taller and 1.78% heavier than other white workers (Scott, 2015).

Some of the farming dietary patterns that contributed to this weight disparity included the limited processing of food and greater consumption of milk, pork, beef, corn, and Irish potatoes. The ‘southern diet’ was essentially developed by southern farmers. Much of the upper south and north of the nation was industrialized and therefore followed nutritionally inferior diets with lower intakes of protein and higher intakes of refined carbohydrates (Scott, 2015).

Fast-forward to 1941 Georgia when rates of childhood malnutrition-obesity were rising. One study documented the food habits of black tenant farmers and found that fried foods, corn, wheat, and pork/pork fat were staple dietary components. Income level and cultural misconceptions about fruits, vegetables, fish, eggs, and milk limited intake of these foods. Numerous university and state departments used the data to respond with nutrition education interventions with mindfulness of financial means. The nutrition researchers measured modest success by increased intake of aforementioned foods and did not measure or mention any changes in weight or health-related conditions (Moore, et. al., 1941).

A 2003 study conducted by Kansas State University uncovered the factors influencing the dietary habits of 147 male farmers and found that Kansas farmers were consuming 1.28 servings of fruit and 1.8 servings of vegetables per day on average (Rundus & Barrett, 2003). The average BMI for farmers was 27.7 and 70.5% of participants had a BMI >25, indicating a high prevalence of overweight. The net annual income for 60% of participants was \$40,000, 49.3% of participants worked for four hours or more outside the farm, and 59% obtained a bachelor’s or a master’s degree. The researchers found that farmers

ate more fruit if their spouse worked off the farm and 48% of farmers obtained nutritional information from their spouse rather than from a doctor, dietitian, television, or other sources. Most farmers did not practice restrained eating and ate the more than the recommended intakes of fat and meat.

The diets of farmers are pertinent to the economic and physical health of the surrounding populations. To pull the discussion towards public health while neglecting to note the economic significance of research findings and vice versa would illustrate only half the picture. Economic research has been finding that small farming can no longer be a sustainable sole occupation. The USDA defines a small farm as one generating \$1,000 or more and less than \$250,000 in gross sales, while a large farm is one generating between \$250,000 and \$500,000 in gross annual sales (Dunckel, 2013).

To frame the demographics of North Carolinian farmers, of the 50,218 principal NC farm operators in 2015, about 87% were male and 13% were female. Of all 73,700 operators, 94% were white, 3% were black or African American, and a handful were American Indian or Alaskan Native, Asian, and Hispanic or Latino. The average age of principal operators was 58.9 (USDA, 2015). There were 50,218 total documented farms in North Carolina in 2012. Of that, 4,155 farms, or 8.3%, were less than 1 to 9 acres in size. The most common farm size in North Carolina was 10 to 49 acres, medium size farming, attributing to 40% of all farms in NC (USDA, 2012). Of all NC farms, 48% of all NC farms produce livestock, poultry or other animal products as their primary crop. The remaining 51% of farms, in order from least number of farms to greatest number of farms, produce primarily hay, soybeans, wheat, corn, vegetables, cotton, tree fruit, tobacco, berries, and other nuts, seeds, and herbs. Of the 5,328,382 acres of land used for farming in NC, only 2.3% of that is used for



vegetables, 0.24% are used for tree fruit, and 0.16% are used for berries. By a landslide, the king crops produced include hay at over 4.7 million tons, corn at 3.3 million tons, wheat at 2.6 tons, and soybeans at 1.8 million tons (USDA, 2012).

Many of these king crops are government-funded; in fact, 29% of NC farms receive government payments for crops. Large-scale farmers may thrive well within the economy through government subsidization; however, small-scale farmers face both the elements and competition in the midst of subsidized market prices without a safety net. As 88% of all American farms are small farms less than 231 acres in size, it makes sense that the majority of farmers rely on a second job for an additional source of income to make ends meet. Even subsistence farmers are not immune to taxes, utility bills, and mortgages. Many times selling produce doesn't equate to much when competing within a deflated market. Thus, it is important to note the dietary habits of farmers from an economic perspective in addition to the health perspective, which is why the questionnaire in this study included questions related to household income and monthly grocery expenses.

From a public health perspective, local, traditional farming is the ideal means for nutrition for communities and farmers alike. Local food is fresher by definition and provides better nutrition than grocery-store equivalents (Frith, 2007). Though canning, grinding, baking, and other forms of rudimentary processing are common among farmers, small-farmed products are far less processed than similar products produced at a larger scale. Chemical bleaching, vitamin supplementation, food coloring, and artificial preservative use are virtually nonexistent among small-farmed products.

As a result, overall rates of cancer and heart disease are lower among farmers than among the general public, likely due to physically active lifestyles, positive dietary habits,

and lower smoking rates. However, farmers are more predisposed to certain cancers, such as leukemia, non-Hodgkin lymphoma, multiple myeloma, and soft tissue sarcoma, and cancers of the skin, lip, stomach, brain, and prostate. Higher rates of these specific cancers are likely due to increased exposure to environmental toxins from pesticides, engine exhausts, solvents, dusts, animal viruses, fertilizers, fuels, and specific microbes (National Cancer Institute, 2011).

In sum, the farming diet ranges by income status and it can be speculated that large-scale farmers consume a diet similar to the SAD due to a lack of crop diversity, leading to a lack of dietary fruit and vegetable diversity. Meanwhile, it can also be hypothesized that small-scale farmers consume a diet comprised of the crops produced on the farm, leading to increased diversity in the diet and increased overall fruit and vegetable intake.

### *The Appalachian Diet*

Appalachian foodways are believed to have derived initially from Cherokee and other Native American tribes and secondly by European immigrants. A recent study was conducted at Appalachian State University exploring the dietary habits of rural residents of the Appalachian Mountains that compared traditional patterns to currently observed patterns in order to provide more culturally competent training for nutrition professionals. The researchers noted that while many traditional preparation methods such as frying or stewing and dietary components such as meat and fats continue to thrive in Appalachian cuisine, intakes of soda and convenience-store foods have increased while physical activity and intakes of fruits and vegetables have decreased. Food waste was very limited as food insecurity appeared to be a consistent theme among rural residents. A strong connection to

family foodways was a common theme promoting the continued practice of high-fat food preparation methods and the consumption of cultural foods. Cultural foods included O Beans (often pinto), biscuits and gravy, blue John (skim milk), buttermilk, cathead (biscuits), corn bread, fatback, fried foods, fruit pies, seasonal garden vegetables, greens, grits, honey, jam, lard, livermush, molasses, Nabs (crackers), persimmons, poke, potatoes, ramps, side meat, soda, souse meat (head cheese), sweet milk (whole milk), and sweet tea, among many others. Traditional staples included buckwheat, corn, pork, beans, poultry, cabbage, green beans, tree fruits, and sugar, honey, or sorghum. Themes related to dietary habits included tradition, matriarchal “gatekeeper,” importance of family meals, finances, cooking vs. buying, and gardening (see Figure 1).

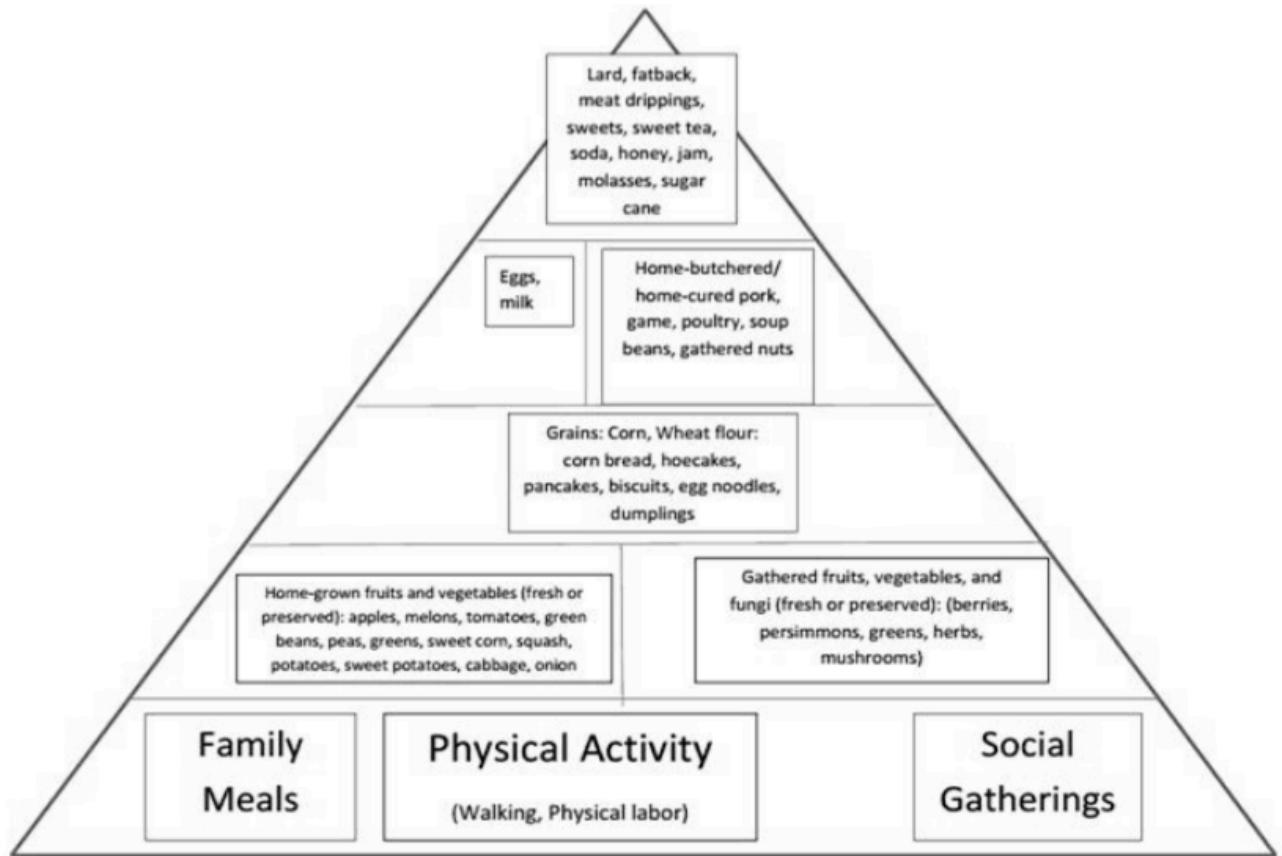


Figure 1: The Traditional Southern Appalachian Diet Pyramid

*Note.* Retrieved from Visocky, Gutschall, Thompson, & Ball, 2016.

Small farming has experienced a drastic decline among rural Appalachian communities. In the outpatient clinics, 18% of clinicians reported that rural patients grow their own food while 10% of their patients reported that rural patients grow their own food. However, gardening was mentioned as a strong theme that was often indicative of improved dietary habits. One participant was quoted stating that farming generations were dying out (Visocky, Gutschall, Thompson, & Ball, 2016).

Many articles point to traditional Appalachian foodways including time and labor-intensive recipes prepared by women of the household. Meanwhile, the men of the household managed the farm and food production aspect. Subsistence farming and foraging was

common practice for rural residents. In addition, community members frequently assisted one another with household and farming tasks, opening the door for bartering and shared meals (Casey-Sturk, 2014).

### *The Appalachian Farming Diet*

There has been a recent resurgence of interest in traditional Appalachian foodways, particularly among young farmers. Increasingly more young college-educated farming advocates are choosing careers in agriculture, reviving traditional agriculture practices while modifying heritage recipes to suit their own nutrition beliefs, creating a new food subculture in southern Appalachia.

Documented trends such as the ‘local food movement’ and ‘agripreneurialism’ offer evidence of the reformation of small-farming production and marketing methods. For instance, many farmers are now also becoming ‘agripreneurs,’ or entrepreneurial farmers who offer products and services that extend beyond traditional farming (Haskell, 2012). Agripreneurial farmers are increasingly introducing value-added products and services, such as organic composting centers, heritage seed banks, artisan microbrews, medicinal herbs, as well as unique jams and canned or preserved items. Local food movements and regional farmer’s market advertising campaigns have also boosted the resurging success of small farmers. It can be assumed that in concordance with the emerging agricultural trends, some Appalachian farmers follow a hybridized diet of traditional Appalachian cultural foods and modern cultural foods.

However, there is still little to no available data related to the diets of Appalachian farmers. It can also be assumed that because most traditional Appalachian residents relied on

small family farms and gardens for sustenance, much of the ‘Appalachian farming diet’ is very similar to the Appalachian diet for long-time farmers.

## **Methods**

### *Study Design and Participants*

This study utilized a semi-structured qualitative interview to collect information about the dietary habits of local farmers. In the fall prior to the scheduled interviews, farmers were recruited for the study through conversation at local farmer’s markets in Watauga and Ashe counties. Criteria for participation in the study included: adults (age 18 or older), English-speaking, self-identification as a farmer, and residency in or in one of the counties neighboring Watauga: Ashe, Avery, Caldwell, and Wilkes. Out of 18 farmers who expressed interest and were later contacted in the spring, a total of 9 interviews were collected.

### *Data Collection*

This study was approved by the Appalachian State University IRB (Appendix A). Participants signed a consent form and the participant’s interview was audio recorded (Appendix B). Participants were met at their private homes/farms and were asked a series of questions as guided by a questionnaire divided into three parts: 1) General Information, 2) Seasonal Intake, and 3) Personal Assessment. The General Information section asked participants to indicate their height, weight, sex, date of birth, race, religious affiliation, highest level of education, number of adults and children in the household, average annual household income, known medical conditions, tobacco use, physical activity habits, and self-identification as a farmer. The Seasonal Intake section was the lengthiest section, asking

participants to elaborate on their farming business, farming season, crop and/or product yield, pathways for obtaining food, monthly expenses on food, seasonal intake recalls, alcohol consumption, restaurant or fast food consumption, fruit and vegetable consumption, and processed food consumption.

The term “Processed Food” was explained to participants as any store-bought food that has been processed beyond washing, cutting, pasteurizing, cooking, or packaging and could not be produced at home. The questionnaire continued, “Processed foods are not found in nature and cannot be cooked or canned at home. Any food with an artificial preservative or artificial additive is automatically considered a processed food. Many processed foods come packaged, canned, or boxed, and contain 3 or more ingredients. Some examples of foods that are not considered ‘processed’ in this study are canned or frozen fruits and vegetables, dairy products, meats, poultry, or other products that could potentially be produced or made at home. Some examples of processed foods include packaged foods labeled with health claims like “low-fat,” or “heart-healthy” such as those found on cereals, baby foods, or snack foods. Fortified foods such as rice or flour also classify as processed foods. Fast food and many mass-produced cook-freeze meals also classify as processed foods. If there is any uncertainty, refer to the interviewer.” The Personal Assessment section allowed the participants to rank their perceived health status on a scale from 1 to 10 with 1 being the least healthy and 10 being the most healthy. Participants were also asked to elaborate on how their diet has changed since childhood and how their diet might compare to the diets of other farmers. Previous exposure to nutrition education was noted in this section. Each participant who scheduled an interview was given a \$20. Each interview lasted about 1.5 hours on average.

## *Data Analysis*

Interviews were audio recorded and transcribed verbatim by a research assistant. Interview transcripts were organized into themes and coded by hand using a grounded analysis, a qualitative method of theorizing and explaining the main concerns of a population using open coding. Transcripts were reviewed for consistency in choice of themes.

## **Results**

### *Demographics*

Table 1 (below) describes the demographics of participants in this study, including participating spouses of the interviewed farmer. As it was criteria for participation in the study, all participants identified themselves as farmers.

Table 1: Demographics

	Range	Median	Average
Age	27-70	62	55.8
BMI	21-48.4	24.4	26.6
Annual household income	\$25,000-\$120,000	\$35,500	\$38,167
Persons in household	1-8	2	3.1
Years farming	3-48	13	19
Total acres	2.5-100	62.5	56.2
Acres in production	2-24	4	7.2
		Number	Percent
Sex			
	Male	7	53.8%
	Female	6	46.2%
Education			
	High school	1	7.7%
	Some college	3	23%
	Bachelor's degree	5	38.5%
	Master's degree	3	23%
	Doctorate degree	1	7.7%
Fitness			
	Regular physical activity (responded yes)	8	61.6%



It is of note that most participants who reported regular physical activity were female. Aside from daily farm work, walking was the most commonly mentioned physical activity, followed by strength-building exercises at the gym or led by a video instructor. Swimming, hiking, rowing, running, biking, and yoga were also mentioned exercises. Most reported intensity levels were low to moderate. Reported exercise sessions ranged from 15 minutes to 60 minutes 1-6 days per week, in sum ranging from about 30 to 180 total minutes per week.

In addition to the demographics listed above, common disease states and health disorders included mental health disorders, diabetes, and to a lesser extent, cardiovascular diseases, asthma, sleep apnea, and disorders of the nervous system.

Some of the major themes that influenced dietary patterns for farmers included farming as a family, seasonal food, ethical food, and crop planning and profit. The majority of the interviews were scheduled with an individual farmer but were held with the participation of a spouse or other family member living in the household. Participants frequently used pronouns such as, “we,” “us,” and “our” when describing dietary and lifestyle habits and beliefs. This along with numerous other mentions of joint ideals and habits indicated a prominent factor affecting food choices was family and family values. Though spouse diets differed, spouse food values did not, as many opinions surrounding food locality, sustainability, costliness, seasonality, healthiness, and freshness were commonly shared by couples.

### **Theme 1: Seasonal Food**

One of the primary themes related to dietary habits present in all interviews was the concept of seasonal diet changes. For high country farmers, there were two main seasonal

distinctions: on-season and off-season. On-season runs from mid-March to mid-October, while off-season runs from mid-October to mid-March. Farmers began crop preparation in mid-March by raising seedlings in hoop houses, harvesting cover crops, pruning and grafting trees, and performing farm maintenance before the last frost. Some farmers began planting cold-hardy crops such as sweet potatoes, potatoes, carrots, kale, spinach, cabbage, turnips, and additional root crops as early as March (see Appendix C).

Most farmers will refrain from planting or transplanting summer crops until late May due to the potential for a late frost. June marked a shift in farming diets from consuming many root crops, meats, stored foods, and store-bought vegetables to consuming more fruits and vegetables overall, particularly fruit. Some farmers set aside a certain percentage of their crops for personal consumption, others ate the leftover crops not sold at the farmer's market, and others grew a small separate garden with a diverse assortment of plants for personal consumption. In sum, the dietary patterns described below were largely dependent on the progress of the farming season.

### *Common Cooking Methods*

Many farmers described themselves as eating healthier overall during the summertime, consuming lighter meals and a wider variety of foods, particularly fruits and vegetables. The most common cooking method for vegetables was sautéing, followed by baking, steaming, and grilling. Deep fried foods were also consumed infrequently by the majority; though deep fried foods were still mentioned in food recalls. Slow cooking and pressure cooking were very common cooking methods in the wintertime.

### *Seasonal Restaurant Patterns*

Most participants ate out more during the summer and early fall due to the acceleration of lifestyles and increased time spent in town, particularly on farmer's market days. During the winter, half of the interviewed farmers ate out less than once per month. Those outside this statistic often held jobs in town during the off-season and tended to consume more restaurant food than those who stayed at the farm or worked on the outskirts of town. During the summer, only 17% of farmers ate out less than once per month while about 50% ate out on a weekly basis. During the winter, that statistic flipped; 50% of farmers ate out less than once per month while about 17% ate out on a weekly basis. On a few instances, one farming spouse who worked off the farm ate out more frequently than the farming spouse who stayed on the farm, which is why spouses were assessed as individuals during data processing. Many farmers who infrequently ate out mentioned local businesses as their preferred restaurants and fast food restaurants as their rarer choice, typically only visited when traveling. Farmers who ate out frequently during the off-season mentioned eating at both local restaurants and fast-food restaurants, but chain fast-food restaurants were far more frequently visited by these individuals than by all other farmers. No chain sit-down restaurants were mentioned in the interviews.

One farmer remarked, "...it's kind of amazing to me to go by all of the fast food places and what the lines are for breakfast every morning. I used to work with people who brought a bag in of something every morning for breakfast and I just thought, one the expense of that, and two the quality of what they were eating every day."

### *Seasonal Food Recalls*

Seasonal food recalls in section two indicated that breakfasts remained fairly consistent year-round. Common year-round breakfasts included bacon and eggs, eggs on toast, high fiber cereals or homemade granolas and milk. On numerous occasions, it was noted by wives that the husband preferred heavier breakfasts with higher fat contents. Common lunch and evening meals in the summertime included stir fried vegetables in olive oil, beans and rice, salad with numerous vegetable toppings, homemade pizza, burritos or tacos, cornbread, grits and other corn products, foods cooked in rendered pork fat, pasta dishes such as spaghetti, baked vegetables and root crops (particularly potatoes), and raw fruits and vegetables. Most farmers noted that dinner was their largest or heaviest meal of the day. Many farmers noted consuming heavier evening meals and more fat overall during the off-season. Common lunch and evening meals during the wintertime included more soups, slow cooker meals, stir fry with frozen and store-bought vegetables, baked foods, self-stored food, sausage, beef, other meats, potatoes, winter vegetables, dried and canned beans, casseroles, and desserts. The shifts in dietary habits after the transition into the off-season winter months were not drastic, yet evident when assessing fruit and vegetable intake, restaurant dining, food storage and preparation methods, and fatty meat consumption.

### *Processed Food Intake*

Processed foods consumed during mealtimes included coffee, refined flour, cereal, rice, pasta, milk, cheese, yogurt, condiments, and chips. Though processed food was consumed multiple times per day by most farmers, processed food consumption was most prevalent in snacking. Foods such as cookies, granola, tortilla chips, potato chips, crackers,

ice cream, beer, and wine reoccurred as popular processed snack foods. Snacking at night or consuming a dessert before bed was relatively common; 56% consumed dessert after a meal 2 to 5 times per week. Soda consumption was very low among farmers; only three farmers mentioned soda, two of who explained intake was a rarer treat while the other mentioned diet soda as the preference. Overall processed food intake remained relatively consistent year-round with the exception of increased restaurant dining during the summertime.

### *Seasonal Fruit and Vegetable Intake*

Consuming farm-grown fruits and vegetables was common practice as a budgeting necessity, among other reasons. For this reason, many of the specific fruits and vegetables (and other products) consumed by individuals were farm-specific. One farmer mentioned, "...I just think when you have lots of access to vegetables and grains and things, there is a tendency to eat it more often and you're eating better. It's part of the budgeting of trying to make it as a farmer, that part of what you grow is for yourself also." Another farmer noted that the main factor affecting his food choices was "what's in season and what I'm picking at the time." Fruit and vegetable intake decreased during the off-season, and for those who remained a constant intake, the variety of fruits and vegetables was limited. For example, during the on-season, 67% of farmers consumed 2-3 servings of fruit per day. That number dropped to 33% during the off-season. During the on-season, 56% of farmers consumed 4-5 servings of vegetables per day. As the off-season transpired, 100% of farmers were consuming an average of 2-3 servings of vegetables per day. For those who consumed a similar amount of fruits and vegetables year-round, the quality was often much lower,

including self-canned items, other dry storage items, dried items, frozen items, and store-bought items. Table 3 (below) describes many of the commonly mentioned stored foods.

Table 3: Stored Foods

Canned foods	Dried foods	Frozen foods	Dry storage foods
Apple butter	Apples & other fruit	Berries	Apples
Jams & jellies	Herbs and spices	Stir-fry vegetables	Potatoes
Pickled vegetables	Mushrooms	Various vegetables	Sweet potatoes
Chow-chow (pickled green tomatoes, peppers, & cabbage)	Deer jerky	Spaghetti sauce	Garlic
Green beans		Meats (chicken, beef, pork, fish)	Onions
Mincemeat (apples or pears, raisins or other dried fruit, citrus, cinnamon, nutmeg, cloves, and suet (beef fat))		Wild meats (deer, turkey, fish, other game)	

### *More on Food Storage*

In addition to the mentioned canned, dried, frozen, and dry storage produce items, many foods hunted or farmed during the on-season were stored for off-season consumption using the same methods. Canned meats were not common mentions by farmers, but dried deer jerky and frozen hunted meats, home-raised or local chicken and beef, home-farmed milk, and homemade cheese were commonly mentioned. Most farmers noted that excess food storage was necessary during the winter in preparation for any road-blocking snow storms that could block grocery store access.

### *Grocery Shopping*

Most farmers visited the grocery store once per week regardless of season, but food expenses increased during the off-season, peaking around February. Most farmers lived 20-

45 minutes away from the nearest grocery store. The average monthly grocery expense for the summer was around \$376 while the average monthly grocery expense for the winter was around \$531, a 41% increase. Summer grocery expenses ranged from \$40 to \$800 while winter grocery expenses ranged from \$80 to \$1,200. One farmer noted, "...two months of the year I feel like a normal person where I have to shop at the grocery store. That's January to February."

### *Bartering*

While most of the seasonal grocery expense disparity occurs because of increased consumption of self-farmed crops during the on-season, a small portion of the grocery expense decline in the summer is attributable to bartering between farmers. Seven out of nine (78%) farming households mentioned bartering with other farmers during the summer to some extent, normally in small quantities. Among the mentioned trades were cheese for apples or peaches, apples for tomatoes, vegetables for babysitting services, sweet potatoes or other vegetables for chicken or honey, among others.

## **Theme 2: Ethical Food**

### *Factors Affecting Food Choices*

Each participant was asked in the third section of the interview to describe the main factors affecting their food choices. The prominent factors affecting food choices were healthiness, cost, locality, and reasons related to food ethics.

One farmer responded immediately, "Cost and availability. Freshness. We do try to locally source as much as we can. Dairy is the one thing we can't locally source unless you

consider Ashe County Cheese local. We rely on the farmer's market a great deal during the summer. Usually the first hour of the farmer's market, well actually in the hour before the farmer's market opens, all of the farmers are at each other's booths buying produce or trading produce before the market opens. So we get a lot of produce from the market that we don't grow ourselves. [But] we find great satisfaction when we can sit down for dinner and everything was grown right on the farm. We love that."

Another farmer answered by explaining their prioritization of local food. "I guess getting as close to the source of the food, where it is produced and grown or whatever. Eliminating as many of the middle steps as you can. And the farmers kind of like to stick together, so we like to support each other. If we don't have it, then we're going to try to get it from another farmer. It's an appreciation for the production of the food."

One farmer who repeatedly elaborated on his ethical stances on food reported that cost is one of the biggest factors affecting his food choices. "Financial status. Your health is your wealth. Even though financial status is a limiting factor, I would say like 75% of our income's on food. I can't say that's for sure, but you know, a large portion of our income is still on food."

A farming couple expressed that their health was a primary motivating factor. "...I learned all these rules about being heart smart, but I don't always follow them. I try maybe 90% or so, you know, but I don't follow it 100%."

All farmers mentioned valuing self-farmed and local food for various ethical reasons at some point during their interview.



### *Diet Changes Over the Lifespan*

Many folks described how their diet has changed since they have become involved in farming and have become more aware of the ethical issues surrounding food. Education level was strongly associated with reports of mindful eating. Others noted that their diet is fairly similar to how it always has been, a common theme among farmers who grew up in farming families. There were several instances in which one spouse grew up eating far more processed food than the other spouse who grew up eating traditional Appalachian foods in a farming family.

“(Husband) Well because I’m from a family that had a lot of farming history, my family when we were in stable environments not being moved base to base across the country across the world, my family always had a garden. So we- so I learned early to eat fresh vegetables and that was more of what people in rural areas did and that was different from [my wife’s]. So they didn’t maintain a garden, so most of her diet came from a grocery store. (Wife) My mom had a little one. Yeah I’d say 99 percent came from the grocery store.”

The husband of one farming couple explained that he had grown up eating from a garden and drinking milk from the family cow, while his wife was raised in a military household and ate primarily store-bought processed foods that were purchased at the beginning of the month at the local Post Exchange and commissary. His wife added, “I didn’t know about this country cooking business until we got married. And they were throwing biscuits across the table, and I was thinking ‘If my mother was here, she would think dead away.’”

Traditional farming diets were briefly described by some of the interviewees. “I remember many times as a youth having to shell beans or snap green beans these kinds of

things to prepare the food that would be cooked that night. These were southern traditions that we would go harvest in the garden in the morning and prep it in the afternoon and eat it at night. That was a lot of my experience.”

Some described minor changes in dietary habits since childhood. “I was raised on grease, so, I try to get away from that a little bit. I'll have fish and foil and bake them more than I fry them, instead of frying them every time... I don't eat as many fried potatoes as I used to, or baked ones. So I don't hardly get as much grease, and other than that it's about the same.”

Other described more drastic changes in dietary habits. The husband of one farming couple explained that though his family frequently ate sit-down meals together during his childhood, he ate a lot of “junk” until his 20s, when he began to make healthier dietary choices. When he met his wife, his diet changed even more, as she has always been health-conscious and followed a vegetarian diet for many years. His wife explained that she rarely ever ate out during her childhood, about once a year, and she has always tried to eat healthy by keeping up with the latest health food trends. After marriage, they moved to a rural area to start their own farm. They grew to value local food, so they joined a co-op with a group of neighbors and raised their son on local meats, eggs, milk, cheese, fruits, and vegetables.

One farmer responded that she doesn't eat at all like she did during her childhood, but she believed that many of the unhealthy foods she consumed then were healthier than some of the same foods available now. “God, I'm meat and potatoes girl, I grew up in a family that was- but again, food back then was not as mass produced and as, I don't know, dangerous. I don't remember recalls for food when I was a kid growing up for E coli or spinach or cantaloupes or... I mean I just don't remember that kind of thing so, my mom used to buy

half a cow at the local farmer. I grew up in New York just outside the city, so there weren't there were two farms where I was growing up, one was just over the Jersey border and one was at the very end of our town and that was the last of that farm. And we had a garden growing up and we grew a lot of stuff. I just think the quality of the food was better back then than it is now because there wasn't so much mass production. Even the big farms were smaller, they weren't these million acres."

Another farming couple described their diet becoming slightly healthier after they discovered one of their daughters suffered from numerous dietary allergies, including an allergy to gluten. Their oldest daughter incited the most change once she became old enough to help with cooking and shopping for the family. She was interested in nutrition and transitioned the family into a diet containing less processed foods and more "natural" foods.

## **Discussion**

In 1941, Dr. I. H. Moore, the Health Officer over Hancock County, Georgia, recorded the typical dietary habits of black tenant farmers in Sparta, Georgia (Moore, et al., 1941). During this time, rates of childhood malnutrition-obesity were rising. Moore noted that fried foods, corn, wheat, and pork/pork fat were staple dietary components. Income level and cultural misconceptions about fruits, vegetables, fish, eggs, and milk limited intake of these foods. Numerous university and state departments used the data to respond with nutrition education interventions with mindfulness of financial means. The nutrition researchers measured modest success by increased intake of aforementioned foods and did not measure or mention any changes in weight or health-related conditions. The traditional southern

farming dietary habits described by Dr. Moore were not practiced by the interviewed participants of the current study.

A comparable study was conducted the Kansas State University (KSU) researchers in 2003 (Rundus & Barrett, 2003). The quantitative study found that 147 male farmers were consuming a daily average of 1.28 servings of fruit and 1.8 servings of vegetables. The average BMI for farmers was 27.7 and 70.5% of participants had a BMI >25, indicating a high prevalence of overweight. The net annual income for 60% of participants was \$40,000 and 49.3% of participants worked for four hours or more outside the farm. About 59% obtained a bachelor's or a master's degree. The researchers found that farmers ate more fruit if their spouse worked off the farm and 48% of farmers obtained nutritional information from their spouse rather than from a doctor, dietitian, television, or other sources. Most farmers did not practice restrained eating and ate the more than the recommended intakes of fat and meat.

Though difficult to objectively compare, the findings of the 2003 KSU study were somewhat consistent with the findings of this study, as the average BMI for farmers in this study was 26.6 (overweight), the median annual household income was \$35,500, and 69% of farmers obtained a bachelor's degree or higher. However, most farmers in this study did practice restrained eating and consumed 2-3 servings of fruit and at least 2-3 servings of vegetables daily on average.

While many traditional preparation methods such as frying or stewing and dietary components such as meat and fats continue to thrive in Appalachian cuisine, intakes of soda and convenience-store foods have increased while physical activity and intakes of fruits and vegetables have decreased (Visocky, Gutschall, Thompson, & Ball, 2016). Food waste was very limited as food insecurity appeared to be a consistent theme among rural residents. A

strong connection to family foodways was a common theme promoting the continued practice of high-fat food preparation methods and the consumption of cultural foods, such as milk, meat and other animal products, beans, corn, and a variety of fruits and vegetables.

The findings of this were only somewhat consistent with findings of the present study. Only a few farmers had consistently similar dietary habits to the ‘Appalachian diet,’ and even he consumed more processed foods and less cultural foods than the traditional Appalachian diet prescribed. However, many participants practiced traditional food-saving practices such as canning and drying, and some consumed cultural foods such as cornbread, potatoes, raw milk, pork, beans, poultry, cabbage, green beans, tree fruit, molasses, and honey. Some farmers also practiced hunting and foraging as supplementary sources of food. Most farmers practiced bartering and conveyed a sense of community when speaking about other farmers in the area. Winter diets of farmers in this study were also more consistent with the traditional Appalachian diet, as intakes of fat, particularly saturated fat from meats, increased significantly as more traditional time-intensive recipes were prepared for meals and celebrations. Winter soups and stews were the most commonly mentioned reminiscent meal of traditional Appalachian foodways. However, overall, Appalachian farmers in this study were consuming a much more processed, less time-intensive, and lower fat diet than the traditional Appalachian diet.

One finding that fell outside the objectives of this study was that all interviewed farmers expressed that an external source of income was necessary to cover personal and operational costs, such as mortgages, loans, utilities, equipment, additional household items, groceries, and other expenses. One farmer stated, “What’s funny is that [with] all the food that you grow, you’d think that you’d just have this abundance of food to eat yourself, but

it's not always like that, and especially not in the winter time, of course. And last year [my partner] broke even on the farm, meaning all the money that she made last year went back into the farm buying seeds, so she didn't make any money. We're hoping that this year will be different. So yeah, this is a very minimum wage kind of job and food should be accessible to all people.”

The strength of this study was certainly fortified by the length and depth of the collected interviews. Each interview lasted one to two hours and included far more information than the questionnaire requested. In addition, each interview was carefully transcribed to document the conversations between interviewer and interviewee following each prompting question. This study is also the first one of its kind; it reports largely qualitative findings on the dietary habits of North Carolina Appalachian farmers, a niche community that follows a divergent diet in comparison to the general public and even other farmers.

However, the dietary habits of this specific population may differ from those of farmers in other parts of the state and other regions of the Appalachian Mountains. Many of the interviewed farmers had college educations and had not grown up farming in western NC. Recruiting participants was a challenge, as many farmers had restrictive schedules despite the recruitment process occurring during the winter off-season. The interpretation of the findings of this study are also limited due to the scarcity of available published literature addressing the dietary habits of farmers.

## **Conclusion**

This study presents novel findings as it is the first one of its kind to address the dietary habits of farmers in the United States, particularly southern Appalachia small farmers. This study revealed that as opposed to previous hypotheses that Appalachian farmers are consuming traditional Appalachian foods or the Standard American Diet, farmers residing in Watauga and surrounding counties are consuming diets heavily dependent on seasonality and food ethics. Diets consisted primarily of farm-grown foods prepared by sautéing, baking, or steaming. The farmers consumed adequate to excellent intakes of fruits and vegetables year-round, though both fruit and vegetable intake was higher during the summer months. Canned, dried, and frozen food intake along with fat and meat intake increased during the winter months. Processed food intake was limited to staple items used in meal preparation, though processed food consumption in snacking was quite prevalent. Restaurant food intake increased during the summer months, though total grocery expenses decreased during the summer. The primary factors affecting food choices were health, locality, and cost. There does not appear to be a need for dietary interventions within this population.

However, throughout the course of the study, alternative concerns for the farmers' well-being arose. As previously described in the discussion section, many farmers were unable to support their families and fund additional operational and personal expenses without an additional source of income fulfilled by either themselves or a spouse. State and national policy changes, such as extending crop subsidization to include fruit and vegetable-growing farms or lessening the cost of becoming a certified organic grower, may alleviate some of the financial strain on these small-scale produce farmers and also benefit both farmer and community health. The community support for high country farmers is abounding, yet

more grocery store partnerships with local growers and financial literacy and budgeting classes may be appropriate interventions that have not been heavily advocated. As this study described the dietary habits of a geographically specific population, the findings of this study are not transferrable to farming communities in other parts of NC and the Appalachian Mountains, so further research in other geographic regions is needed in order to determine appropriate upper-level intervention strategies.



## Appendix A



### INSTITUTIONAL REVIEW BOARD

Office of Research Protections

ASU Box 32068

Boone, NC 28608

828.262.2692

Web site: <http://researchprotections.appstate.edu/>

Email: [irb@appstate.edu](mailto:irb@appstate.edu)

---

**To:** Jordan Miller  
Nutrition and Health Care Management  
EMAIL

**From:** Dr. Lisa Curtin, Institutional Review Board Chairperson

**Date:** January 13, 2016

**RE:** Notice of IRB Approval by Expedited Review (under 45 CFR 46.110)

**Study #:** 16-0104

**Study Title:** Exploring Food Habits and Diet Seasonality Among Farmers in the High Country

**Submission Type:** initial

**Expedited Category:** 6. Collection of Data from Recordings made for Research Purposes; 7. Research on Group Characteristics or Behavior, or Surveys, Interviews, etc.

**Approval Date:** January 13, 2016

**Expiration Date of Approval:** January 12, 2017

The Institutional Review Board (IRB) approved this study for the period indicated above. The IRB found that the research procedures meet the expedited category cited above. IRB approval is limited to the activities described in the IRB approved materials, and extends to the performance of the described activities in the sites identified in the IRB application. In accordance with this approval, IRB findings and approval conditions for the conduct of this research are listed below.

The IRB determined that this study involves minimal risk to participants.

### **Approval Conditions:**

Appalachian State University Policies: All individuals engaged in research with human participants are responsible for compliance with the University policies and procedures, and IRB determinations.

Principal Investigator Responsibilities: The PI should review the IRB's list of PI responsibilities. The Principal Investigator (PI), or Faculty Advisor if the PI is a student, is ultimately responsible for ensuring the protection of research participants; conducting sound ethical research that complies with federal regulations, University policy and procedures; and maintaining study records.

Modifications and Addendums: IRB approval must be sought and obtained for any proposed modification or addendum (e.g., a change in procedure, personnel, study location, study instruments) to the IRB approved protocol, and informed consent form before changes may be implemented, unless changes are necessary to eliminate apparent immediate hazards to participants. Changes to eliminate apparent immediate hazards must be reported promptly to the IRB.

Approval Expiration and Continuing Review: The PI is responsible for requesting continuing review in a timely manner and receiving continuing approval for the duration of the research with human participants. Lapses in approval should be avoided to protect the welfare of enrolled participants. If approval expires, all research activities with human participants must cease.

Prompt Reporting of Events: Unanticipated Problems involving risks to participants or others; serious or continuing noncompliance with IRB requirements and determinations; and suspension or termination of IRB approval by an external entity, must be promptly reported to the IRB.



**INSTITUTIONAL REVIEW BOARD**

Office of Research Protections

ASU Box 32068

Boone, NC 28608

828.262.2692

Web site: <http://researchprotections.appstate.edu/>

Email: [irb@appstate.edu](mailto:irb@appstate.edu)

---

Closing a study: When research procedures with human subjects are completed, please complete the Request for Closure of IRB review form and send it to [irb@appstate.edu](mailto:irb@appstate.edu).

**Websites:**

1. PI responsibilities: <http://researchprotections.appstate.edu/sites/researchprotections.appstate.edu/files/PI%20Responsibilities.pdf>

2. IRB forms: <http://researchprotections.appstate.edu/human-subjects/irb-forms>

CC Lanae Ball

Maggie Gartman

## Appendix B



### What Do Farmers Eat Today?

Principal Investigator: Jordan Miller

Department: Nutrition and Health Care Management

Contact Information: Dr. Lanae Ball [ballkl@appstate.edu](mailto:ballkl@appstate.edu)

828-262-2983

### **Consent to Participate in Research** ***Information to Consider About this Research***

I agree to participate as an interviewee in this research project, which concerns my eating habits as a farmer. The interview will take place in my personal home and will last one hour. I understand the interview will be about my eating habits, especially what I eat throughout the different seasons.

I understand that there are no foreseeable risks associated with my participation. I also know that this study may benefit society in the long run by gaining a better understanding of how to support farmers in the High Country. The results of this study will also help policy-makers identify policies to support farmers, improve diet, and increase fruit and vegetable intake.

I understand that the interview(s) will be audio recorded and may be published. I understand that the audio recordings of my interview may be recorded on a digital recorder, and then the recordings will be transported and stored in Dr. Ball's office for transcription, if I sign the authorization below. No identifiable names will be on the recordings, and they will be transcribed word for word by members of the research team, and quotations will be pulled out. My privacy will be protected. My person will not be identified by name or other identifiable information as being part of this project.

I give Jordan Miller (and Dr. Lanae Ball) ownership of the transcripts and recordings from the interview she conducts with me and understand that and transcripts will be kept in researcher's possession. The transcripts will be securely stored without any identifying information indefinitely, and contact information will be destroyed upon study completion. I understand that information or quotations from *transcripts* may be published. I understand I will receive compensation for my time in the form of \$20 cash.

I understand that the interview is voluntary and there are no consequences if I choose not to participate. I also understand that I do not have to answer any questions and can end the interview at any time with no consequences. I have the right to refuse to participate or to withdraw at any time, without penalty. If I do withdraw, it will not affect me in any way. If I choose to withdraw, I may request that any of the data which has been collected be destroyed unless it is in a de-identifiable state.

If I have questions about this research project, I can call *Lanae Ball* at (828) 262-2983 or the Appalachian Institutional Review Board Administrator at 828-262-2692(days), through email at [irb@appstate.edu](mailto:irb@appstate.edu) or at Appalachian State University, Office of Research Protections, IRB Administrator, Boone, NC 28608.

This research project has been approved on January 13, 2016 by the Institutional Review Board (IRB) at Appalachian State University. This approval will expire on January 12, 2017 unless the IRB renews the approval of this research.

I request that my name **not** be used in connection with tapes, transcripts, photographs or publications resulting from this interview.

By signing this form, I acknowledge that I have read this form, had the opportunity to ask questions about the research and received satisfactory answers, and want to participate. I understand I can keep a copy for my records.

---

Participant's Name (PRINT)  
Date

Signature

Farming season beginning and end:							
	JAN	FEB	MAR	APR	MAY		
watermelon beans, corn, pepper, summer squash, eggplant green beans, sunflowers herbs, wild plant foraging ^squash, ^zucchini ^kale, ^lettuce, ^peas, ^beans, ^corn, ^peppers, ^tomatoes, ^berries, ^apples, ^Asian pears, ^okra ^spinach, *beet greens, ^collards, *bok choy	Participant 09	*lettuce, *collards	cauliflour, broccoli, fennel	snap peas, melons, tomatoes			
	Participant 08	baked goods	green beans, corn, potatoes, radishes, carrots, garlic, lettuce, asparagus, eggs, meat chickens				
	Participant 07	orchard pruning, *tree grafting	garlic, onion, cabbage, leeks, squash, potatoes				
	Participant 06	livestock, eggs	peas, carrots				
	Participant 05	*seedlings	broccoli, cauliflower, radishes, lettuces				
	Participant 04	*sweet potatoes, ^potatoes, ^molasses					
	Participant 03	^white clover & ^winter wheat cover crops	*tomatoes, *peppers, *squash	spinach, lettuce, swiss chard, cabbage, broccoli, peas, *herbs			
	Participant 02	^winter rye, clover, & ^oat straw cover crops	potatoes, kale, beets, leeks, beans, lemon balm, stinging nettles, dolce, spalanthies, holy basil, squash				
	Participant 01	*spinach, *beet greens, ^collards, *bok choy	Eggs (year-round)	meat chickens (year-round)	mushrooms (until Oct.)		
	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
apples, pears					*lettuce, collards		
					baked goods		
					orchard pruning		
green beans, sunflowers					row cover season extension	livestock, eggs	
					turnips, potatoes, Christmas trees (year round)		
herbs, wild plant foraging							
^squash, ^zucchini					garlic	winter rye, clover, & oat straw cover crops	
^kale, ^lettuce, ^peas, ^beans, ^corn, ^peppers, ^tomatoes, ^berries, ^apples, ^Asian pears, ^okra							
^spinach, *beet greens, ^collards, *bok choy							

## Appendix C

## Works Cited

Carson, S. A. (2015, December). A Weighty Issue: Diminished Net Nutrition Among the U.S. Working Class in the Nineteenth Century. *Demography*, 52(3), 945-966.

Casey-Sturk, M. (2014, April 1). Appalachian foods: Defining generations. Appalachian foods: Defining generations. *Smoky Mountain Living: Celebrating the South Appalachian*.

Retrieval from <http://www.smliv.com/features/appalachian-foods-defining-generations/>

Corda, J., Eaton, S. B., Sebastian, J., Ma, N., Lindeberg, S., Watkins,

- B. A., O'Keefe, H. J., & Brand-Miller, J. (2005). Origins and evolution of the Western diet: health implications for the 21st century. *Am J Clin Nutr*, 81(2), 341-354.
- Denke, M. A. (2016, June). Changing Dietary Habits and Improving the Healthiness of Diets in the United States. *JAMA*, 315(23), 2527-2529.
- Dunckel, M. (2013, November). Small, medium, large – Does farm size really matter? *Michigan State University Extension*. Retrieved from [http://msue.anr.msu.edu/news/small\\_medium\\_large\\_does\\_farm\\_size\\_really\\_matter](http://msue.anr.msu.edu/news/small_medium_large_does_farm_size_really_matter)
- Farmer, J. R, Chancellor, C., Robinson, J. M; West, S., & Weddell, M. (2014). Agrileisure: Farmers' Markets, CSAs, and the Privilege in Eating Local. *Journal of Leisure Research*, 46(3), 313-328.
- Fields, S. (2004, October). The Fat of the Land: Do Agricultural Subsidies Foster Poor Health? *Environ Health Perspect.*, 112(14), 820-823.
- Frith, K. (2007, January). “Is Local Food More Nutritious?” It Depends. *Harvard T. H. Chan School of Public Health*. Retrieved from [http://www.chgeharvard.org/sites/default/files/resources/local\\_nutrition.pdf](http://www.chgeharvard.org/sites/default/files/resources/local_nutrition.pdf)
- Grotto, D. & Zeid, E. (2012, December). The Standard American Diet and Its Relationship to the Health Status of Americans. *Nutr Clin Pract*, 25(6), 603-612.
- Gutschall, M. & Thompson, K. (2015). Rural Appalachian Foodways from Then to Now: Using Traditional Foods to Enhance Dietetic Practice. *Appalachian State Department of Nutrition and Health Care Management*. Retrieved from <http://www.eatrightnc.org/assets/Webinars/appalachian%20foods.pdf>

- Haskell, J. (2012). Assessing the Landscape of Local Food in Appalachia. *Appalachian Regional Commission*. Retrieved from <http://www.arc.gov/images/programs/entrep/assessinglandscapeoflocalfoodinappalachia.pdf>
- Koenig, L. (2014, January). Why Many Farmers Eat Like Crap. *Modern Farmer*. Retrieved from <http://modernfarmer.com/2014/01/many-farmers-eat-like-crap/>
- McCormack, L. A. Laska, M. N., Larson, N. I., & Story, M. (2010, March). Review of the Nutritional Implications of Farmers' Markets and Community Gardens: A Call for Evaluation and Research Efforts. *JAND*, 110(3), 399-408.
- Moore, I. H., et. al. (1943). The Problem of Changing Food Habits: Report of the Committee on Food Habits 1941–1943: Research in the Field of Food Habits. National Research Council (US) Committee on Food Habits. *National Academies Press (US)*. Retrieved from <http://www.ncbi.nlm.nih.gov/books/NBK224354/>
- National Cancer Institute (2011, June). Agricultural Health Study. *National Institutes of Health*. Retrieved from <http://www.cancer.gov/about-cancer/causes-prevention/risk/ahs-fact-sheet>
- Rundus, T. S., & Barrett, B. (2003, December). Factors Affecting Food Choices of Men in Production Agriculture in Kansas. *Journal of Extension*, 41(6).
- Ruth-McSwain, A. (2012, October). Eating Green: Coverage of the Locavore Movement. *Journal of the Extension*, 50(5).

Sauceman, F. (2013, March). What Exactly Is Appalachian Cuisine? *What it Means to Be American*. Retrieved from <http://www.whatitmeanstobeamerican.org/places/what-exactly-is-appalachian-cuisine/>

Schoenberg, N. E., Howell, B. M., Swanson, M., Grosh, C., & Bardach, S. (2013, Aug. 29). Perspectives on Healthy Eating Among Appalachian Residents. *J Rural Health, 1*, 25-34.

Schnell, S. M. (2013, March). Food miles, local eating, and community supported agriculture: putting local food in its place. *Agriculture and Human Values, 30*(4), 615-628.

USDA Agricultural Research Service. (2015). All Restaurants: Percent Reporting, Mean Amounts, and Percent of Selected Nutrients from Foods Obtained from All Restaurants, by Gender and Age, What We Eat in America, NHANES 2011-2012 [Data File]. Retrieved from [http://www.ars.usda.gov/SP2UserFiles/Place/80400530/pdf/1112/Table\\_53\\_RST\\_GEN\\_11.pdf](http://www.ars.usda.gov/SP2UserFiles/Place/80400530/pdf/1112/Table_53_RST_GEN_11.pdf)

USDA Agricultural Research Service. (2014). Energy Intakes: Percentages of Energy from Protein, Carbohydrate, Fat, and Alcohol, by Gender and Age, What We Eat in America, NHANES 2011-2012 [Data File]. Retrieved from [http://www.ars.usda.gov/SP2UserFiles/Place/80400530/pdf/1112/Table\\_5\\_EIN\\_GEN\\_11.pdf](http://www.ars.usda.gov/SP2UserFiles/Place/80400530/pdf/1112/Table_5_EIN_GEN_11.pdf)



USDA Census of Agriculture. (2012). Land in Farms, Harvested Cropland, and Irrigated Land, by Size of Farm: 2012 and 2007 [Data File]. Retrieved from [https://www.agcensus.usda.gov/Publications/2012/Full\\_Report/Volume\\_1,\\_Chapter\\_1\\_State\\_Level/North\\_Carolina/st37\\_1\\_009\\_010.pdf](https://www.agcensus.usda.gov/Publications/2012/Full_Report/Volume_1,_Chapter_1_State_Level/North_Carolina/st37_1_009_010.pdf)

USDA Census of Agriculture. (2012). Selected Characteristics of Irrigated and Nonirrigated Farms: 2012 and 2007 [Data File]. Retrieved from [https://www.agcensus.usda.gov/Publications/2012/Full\\_Report/Volume\\_1,\\_Chapter\\_1\\_State\\_Level/North\\_Carolina/st37\\_1\\_011\\_011.pdf](https://www.agcensus.usda.gov/Publications/2012/Full_Report/Volume_1,_Chapter_1_State_Level/North_Carolina/st37_1_011_011.pdf)

USDA Census of Agriculture. (2012). Specified Crops by Acres Harvested: 2012 and 2007 [Data File]. Retrieved from [https://www.agcensus.usda.gov/Publications/2012/Full\\_Report/Volume\\_1,\\_Chapter\\_1\\_State\\_Level/North\\_Carolina/st37\\_1\\_037\\_037.pdf](https://www.agcensus.usda.gov/Publications/2012/Full_Report/Volume_1,_Chapter_1_State_Level/North_Carolina/st37_1_037_037.pdf)

USDA Census of Agriculture. (2015). 2015 State Agriculture Overview: North Carolina [Data File]. Retrieved from [https://www.nass.usda.gov/Quick\\_Stats/Ag\\_Overview/stateOverview.php?state=NC&county=ALL](https://www.nass.usda.gov/Quick_Stats/Ag_Overview/stateOverview.php?state=NC&county=ALL)

Visocky, S. (2016, February). Rural Appalachian Foodways from Then to Now: Using Traditional Foods to Enhance Dietetic Practice. *Appalachian State Office of Student Research*. Retrieved from <https://forms.osr.appstate.edu/projects/researchDetail.cfm?title=Rural%20Appalachian%20Foodways%20from%20Then%20to%20Now:%20Using%20Traditional%20Foods%20to%20Enhance%20Dietetic%20Practice>

Willcox, K. (2009, March). Eating Appalachia: The Pursuit of Fried Squirrel. *Eat Me Daily*.

Retrieved from <http://www.eatmedaily.com/2009/03/eating-appalachia-the-pursuit-of-fried-squirrel/>

Wilson, M. M., Reedy, J., & Krebs-Smith, S. M. (2016, February). American Diet Quality:

Where It Is, Where It Is Heading, and What It Could Be. *Journal of the Academy of Nutrition and Dietetics*, 116(2), 103-110.

Winchester Hospital. (2016). A History of American Eating Habits. Retrieved from

<http://www.winchesterhospital.org/health-library/article?id=14001>